Describe what data is stored in the database. (Where is the data from, and what attributes and information would be stored?)

The Storm Events Database contains severe weather events across the US from 1950 to this year, from the NOAA's National Center for Environmental Information (NCEI). The database stores information about a storm event's location, azimuth, distance, impact, and severity, including the cost of damages to property and crops. It also contains information on the occurrence of storms and other significant weather phenomena with the intensity to cause loss of life, injuries, significant property damage, and/or disruption to commerce, rare/unusual, weather phenomena, and other significant meteorological events.

What are the basic functions of your web application? (What can users of this website do? Which simple and complex features are there?)

Users will be able to observe severe weather trends in queried U.S. locations over periods of time to observe trends in characteristics such as property damage and area of effect. The functional idea is to enable risk assessment for projects such as construction and agriculture, but users will additionally be able to search for different types of weather to see a historical ranking of the most dangerous phenomena, categorized in a way they want (e.g. amount of precipitation sorted in descending order).

What would be a good creative component (function) that can improve the functionality of your application? (What is something cool that you want to include? How are you planning to achieve it?)

Data visualization of trends in storm intensity over a period of time i.e. wind speeds of hurricanes in Florida since the 50s would enhance the user experience by providing a more easily comprehensible view of data. The selection of multiple different areas for side-by-side comparisons would additionally streamline the comparison process.

We intend on making this happen by

Project Title: Storm Tracker

<u>Project Summary:</u> It should be a 1-2 paragraph description of what your project is.

Our website is a place for accessing comprehensive information on significant storms that have occurred across the United States over the past decade. Powered by the

Storm Events Database from NOAA's National Center for Environmental Information (NCEI), our website will offer a user-friendly interface designed to make the wealth of storm data easily accessible to users.

On our platform, users can effortlessly browse and explore major storms, categorized by year, severity, and impact. Each storm event is detailed, providing information on its location, azimuth, distance, impact, and severity, including the costs of property and crop damages. Our goal is to make it effortless for you to research and showcase significant weather phenomena, from devastating hurricanes to rare meteorological events. Whether you are a weather enthusiast, a researcher, or simply curious about the recent history of storms in the United States, our website offers a valuable resource to dive into the last decade of big storms, all in one place.

Description of an application of your choice. State as clearly as possible what you want to do. What problem do you want to solve, etc.?

The problem we aim to solve with our storm event tracker is the difficulty of accessing storm event data. Currently, this information is dispersed across various sources, making it challenging for researchers, and the general public to find and utilize this valuable data effectively. Storm Event seeks to streamline this process by centralizing the data and presenting it in an easily navigable and informative format.

We will accomplish this goal by ensuring rapid access from user queries to information about storms in specific locations at specific periods of times. In the case of specified locations, we will present the relevant storms over the course of our dataset's history. In the case of specified time periods, we will present the relative storms and their corresponding locations to the user. From there they will be free to sort that information based on the kinds of presented characteristics and compare said info with other periods of time/locations. Visualizing that data in the form of graphs will be a stretch goal.

Usefulness. Explain as clearly as possible why your chosen application is useful. Make sure to answer the following questions: Are there any similar websites/applications out there? If so, what are they, and how is yours different

Centralized Access to Critical Data: It consolidates a vast amount of storm event data from NOAA's National Center for Environmental Information (NCEI) into one website. This eliminates the need to search multiple sources, saving users time and effort.

Efficient Research and Analysis: Researchers, meteorologists, and academics can easily access and analyze historical storm event data. This helps them identify patterns, trends. This contributes to a better understanding of severe weather phenomena and climate change.

Granular presentation of historical trends: most weather-oriented sites tend to focus on an immediate presentation of current weather events and predictions for the near future while providing a broader overview of older information such as the NCEI's own historical trends page. Our website would enable users to focus on specific locations over specific periods of time.

Realness. Describe what your data is and where you will get it.

Our data is from the Google Cloud Dataset. This public dataset is hosted in the Google BigQuery.

This is the link to our dataset:
https://console.cloud.google.com/marketplace/product/noaa-public/severe-storm-events?_ga=2.66405160.746161094.1694302286-203591191.1694302286

According to Google Cloud

"The Storm Events Database is an integrated database of severe weather events across the United States from 1950 to this year, with information about a storm event's location, azimuth, distance, impact, and severity, including the cost of damages to property and crops. It contains data documenting:

- The occurrence of storms and other significant weather phenomena having sufficient intensity to cause loss of life, injuries, significant property damage, and/or disruption to commerce
- Rare, unusual, weather phenomena that generate media attention, such as snow flurries in South Florida or the San Diego coastal area
- Other significant meteorological events, such as record maximum or minimum temperatures or precipitation that occur in connection with another event."

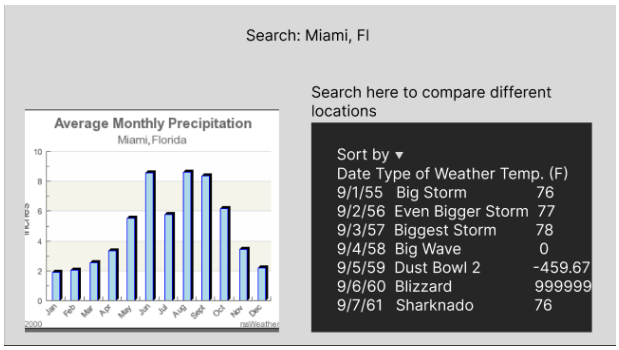
Description of the functionality that your website offers. This is where you talk about what the website delivers. Talk about how a user would interact with the application (i.e., things that one could create, delete, update, or search for). Read

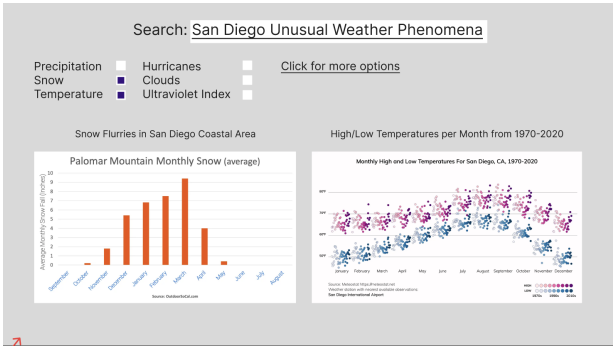
the requirements for stage 4 to see what other functionalities you want to provide to the users. You should include:

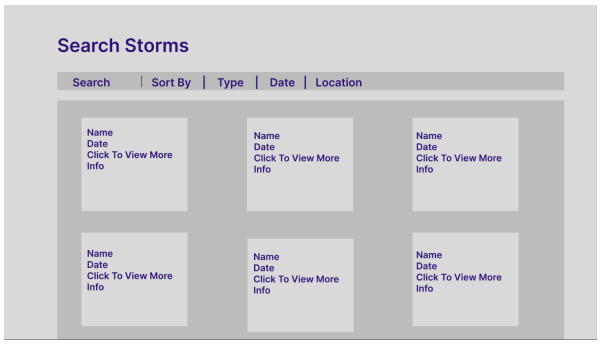
Users will be able to:

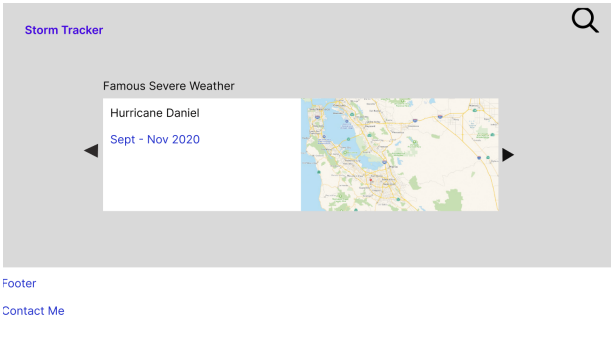
- Ability to insert, update, and delete storms
- Search the database using a keyword search. Our application allows the user to filter by category and then search to find a specific storm
- Allow users to report and update storm events for a specific location
- Users can click on a specific storm search result and view more information about the storm. This should take you to /storm/id endpoint for example
- For our creative functionality if time allows we plan to grab data from an API of popular storm events and allow users to view them on the homepage

<u>A low-fidelity UI mockup:</u> What do you imagine your final application's interface might look like? A PowerPoint slide or a pencil sketch on a piece of paper works!









<u>Project work distribution:</u> Who would be responsible for each of the tasks or subtasks? List of the person responsible for which exact functionalities in

section 6. Explain how backend systems will be distributed across members. Be as specific as possible as this could be part of the final peer evaluation metrics.

Leena: Will be responsible for the update storms from the CRUD table, and one filter by category which will filter by type. Work on taking users to /storms/id endpoint when a storm is clicked. And show more info about the specific storm

Keli: Will be responsible for deleting storms from the CRUD table, and one filter by category which will be filter by location. Work on searching the database using a keyword search.

Bri: Will be responsible for updating storms from the CRUD table, and one filter by category which will be casualties or property damage. Work on the search button which will call the backend and prompt a query search.

Creative Functionality: We will all work on this portion if time permits.